

No. 729,456.

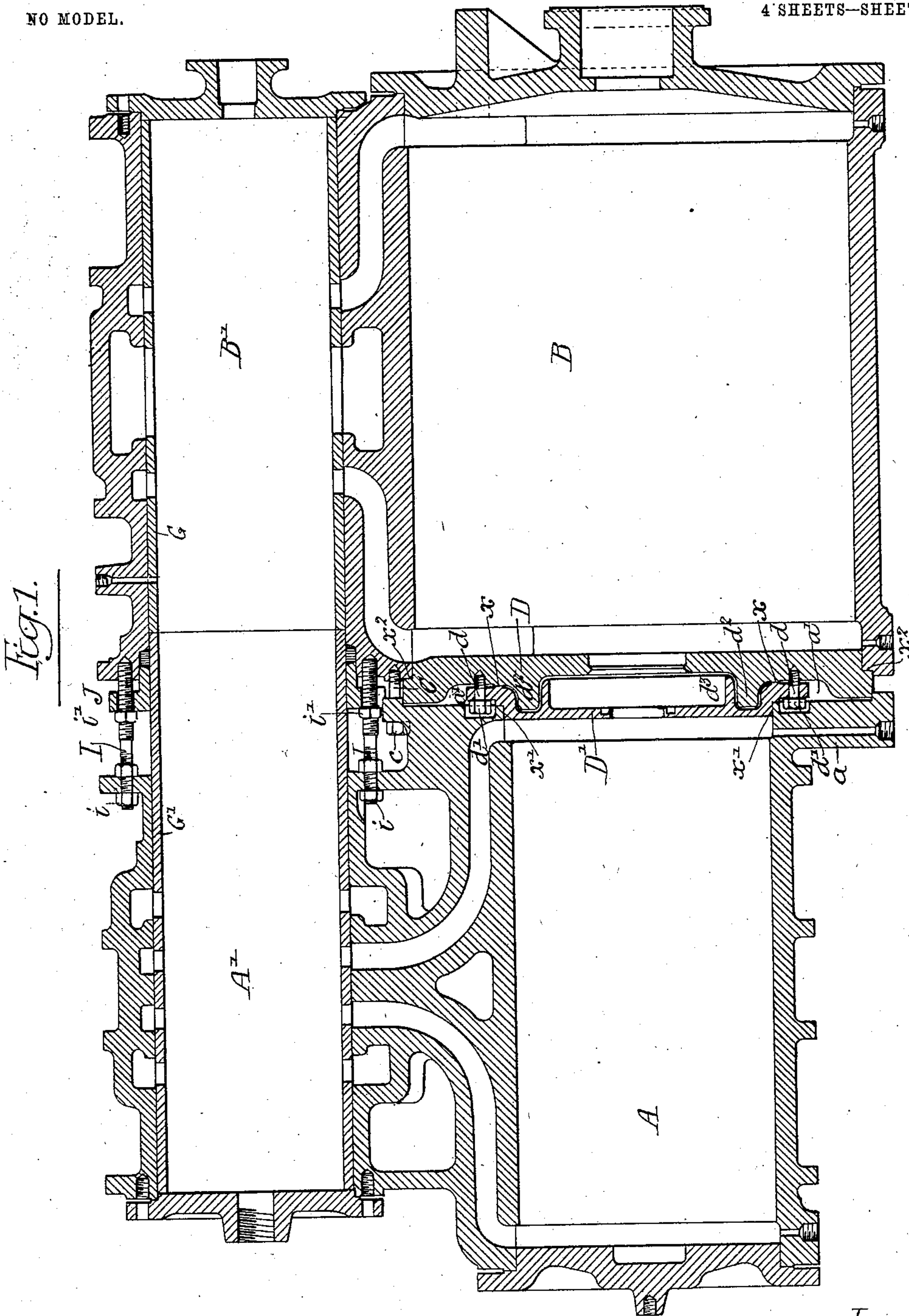
PATENTED MAY 26, 1903.

S. M. VAUCLAIN.
TANDEM COMPOUND ENGINE.

APPLICATION FILED MAY 3, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:-

Titus H. Irons
Wm. A. Barr.

Inventor:-

Samuel M. Vauclean,
by his Attorneys;

Hiram & Hiram

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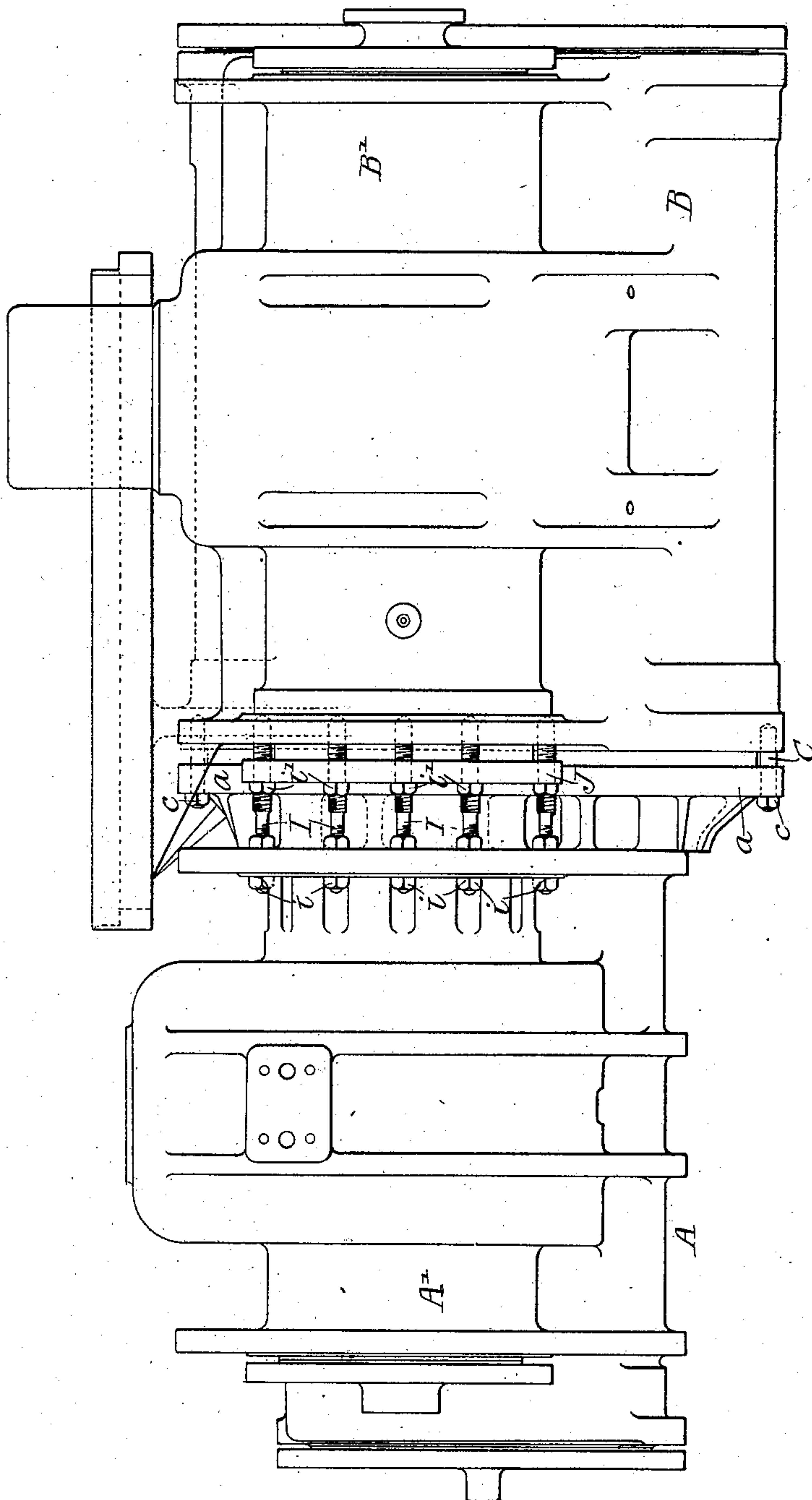
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4 SHEETS—SHEET 2.

Fig. 2.



Witnesses:-

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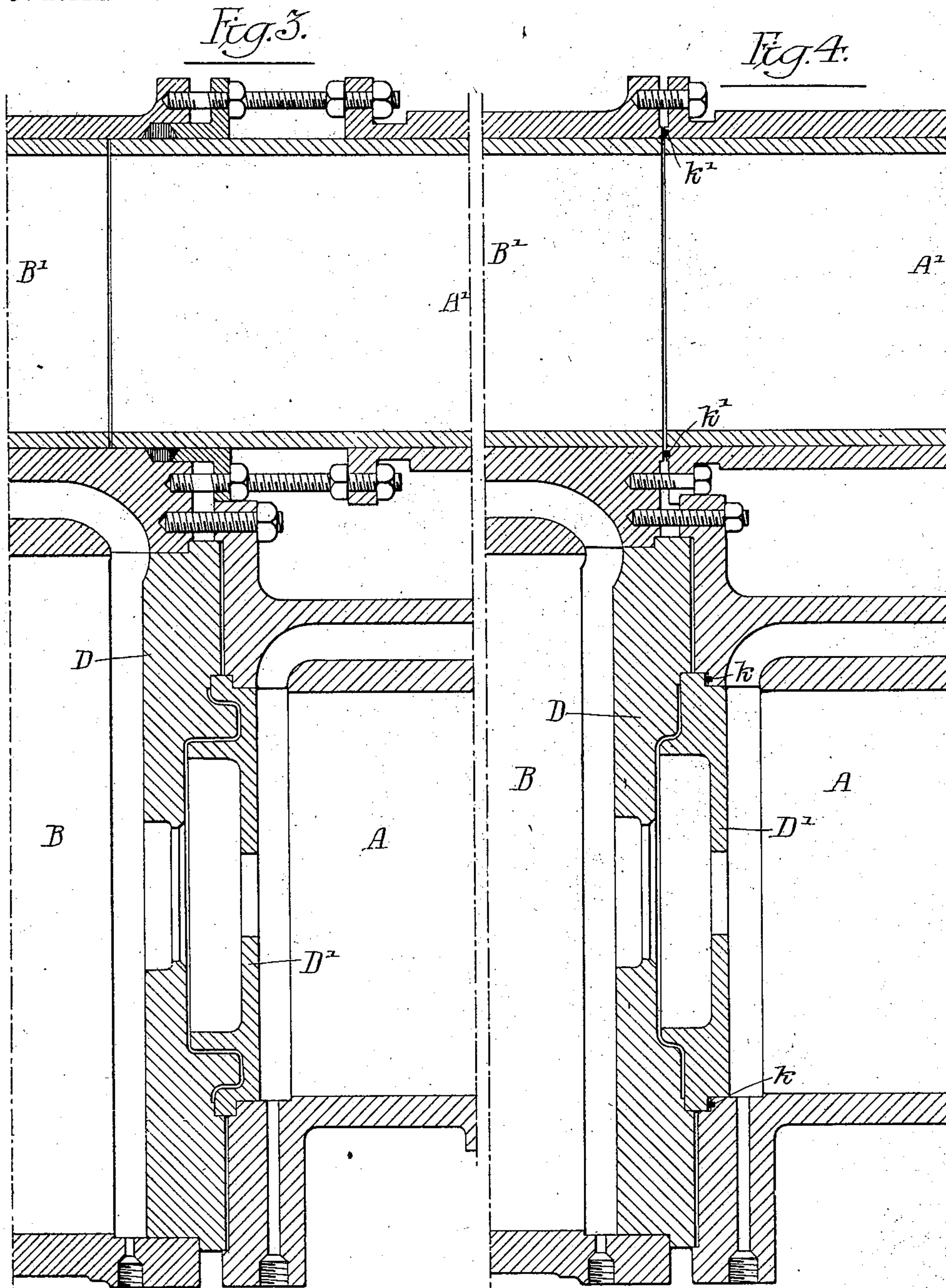
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4 SHEETS—SHEET 3.



Witnesses:-

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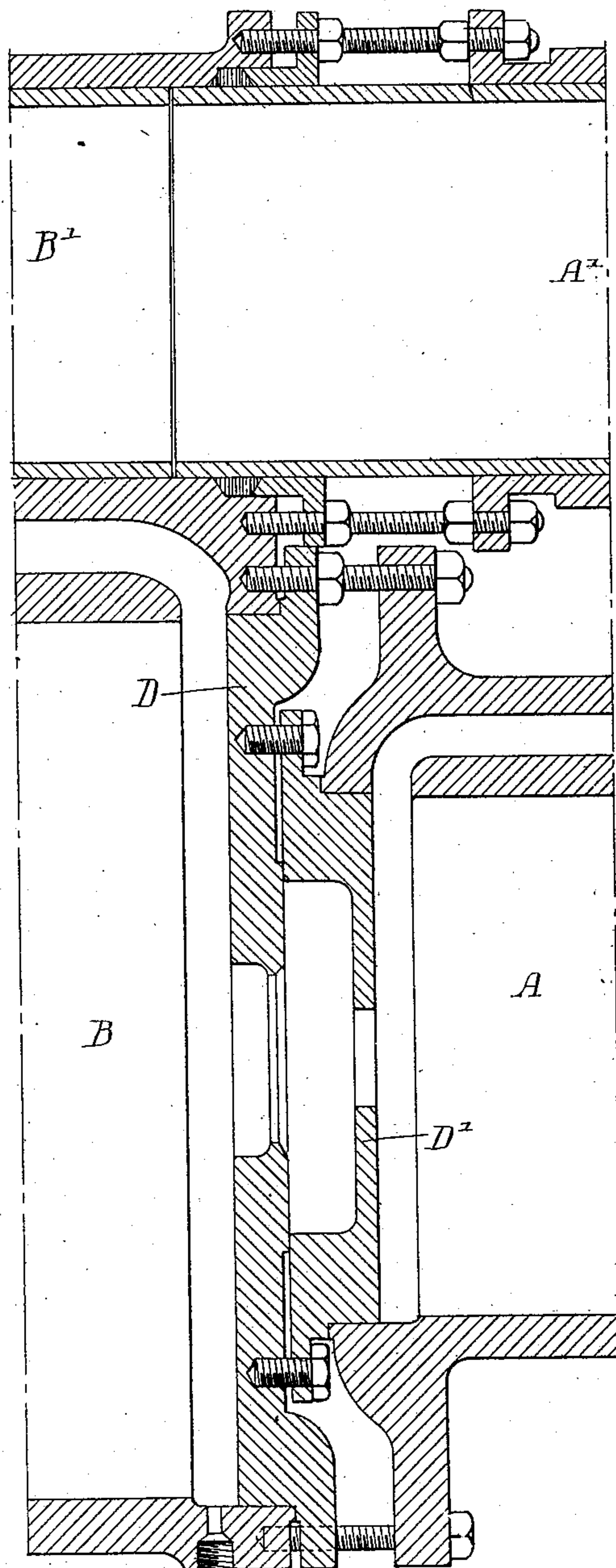
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APPLICATION FILED MAY 3, 1902.

NO MODEL.

4 SHEETS—SHEET 4.

Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

SAMUEL M. VAUCLAIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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A FIRM.

TANDEM COMPOUND ENGINE.

SPECIFICATION forming part of Letters Patent No. 729,456, dated May 26, 1903.

Application filed May 3, 1902. Serial No. 105,806. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. VAUCLAIN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Tandem Compound Engines, of which the following is a specification.

My invention relates to certain improvements in tandem compound locomotive-engines.

The object of my invention is to provide means for attaching the high-pressure cylinder and valve-chest to the low-pressure cylinder and valve-chest without the use of internal bolts. This object I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of sufficient of a tandem locomotive-engine to illustrate my invention. Fig. 2 is a plan view, and Figs. 3, 4, and 5 are views of modifications of my invention.

A is the high-pressure cylinder, having a valve-chest A' integral therewith. B is the low-pressure cylinder, having a valve-chest B' also integral therewith, the two valve-chests A' and B' being in line, as indicated in Fig. 1.

D is the partition-head separating the low-pressure cylinder from the high-pressure cylinder. This head snugly fits the low-pressure cylinder and is clamped thereto by the flange *a* of the high-pressure cylinder. Stud-bolts C, screwed into the flange of the low-pressure cylinder, extend through openings in the flange *a* of the high-pressure cylinder and are provided with nuts *c*, so that the high-pressure cylinder is rigidly clamped to the low-pressure cylinder, and the partition-head D is held firmly in place between the two cylinder-castings.

Secured to the partition-head D is a cover-plate D', forming, in fact, one head of the high-pressure cylinder. This cover-plate has external lugs through which stud-bolts *d* extend, which are provided with nuts *d'*. The stud-bolts project from the head D. The nuts are not within either cylinder, but rest in a recess *a'*, formed in the end of the casting of the high-pressure cylinder, so that it is impossible for these nuts to become loose and find their way into the cylinder. There is a ground joint between the head D and the cap

D' at *x*, and there is a ground joint between the cap and the high-pressure-cylinder casting at *x'*. There is also a ground joint between the head D and the casting of the low-pressure cylinder at *x''*, so that the joint is absolutely steam-tight.

On the head D is an annular flange *d''*, and extending within the space formed by this flange is an annular flange *d'''*, projecting from the cap D'. These two flanges form a cavity for the reception of a suitable packing-box for the piston-rod of the engine. On this piston-rod are the two pistons, one mounted in the high-pressure cylinder and the other mounted in the low-pressure cylinder.

The two steam-chests A' and B', as remarked above, are formed integral with their respective cylinders and are secured together by stud-bolts I, which in the present instance are screwed into the flange of the low-pressure-cylinder casting and extend through flanges in the high-pressure-cylinder casting. These bolts are provided with nuts *i* for drawing the castings together. The low-pressure valve-chest is provided with a bushing G and the high-pressure valve-chest with a bushing G'. This latter bushing extends into the low-pressure valve-chest a certain distance, and a follower J is mounted on the said bushing and has an extension which enters the box in the low-pressure casting, in which packing is placed. The follower is drawn tightly upon the packing by means of nuts *i'* on the stud-bolts I. The passages leading from the valve-chests to their respective cylinders can be made in any form desired without departing from the main feature of my invention.

In Fig. 3 I have shown a modification of the invention in which the bolts *d*, securing the cap to the head D, are dispensed with, the cap having a flange which is held between the end of the high-pressure cylinder and the partition-head.

In Fig. 4 I have shown a method of fastening the two cylinders together in which a soft-metal packing-ring *k* is used between the cap D' and the high-pressure cylinder A and a soft packing-ring *k'* used between the two valve-chests. In this instance the follower and packing are dispensed with and the two parts being drawn up onto the soft-metal

packing-rings by short stud-bolts. While I have shown soft-metal packing-rings, they may be dispensed with and the parts fitted together by ground joints.

5 In Fig. 5 I have shown the intermediate head secured to the low-pressure cylinders by the stud-bolts which secure the two cylinders together, special nuts being provided for this purpose, the plate being secured to the
10 head by special outside bolts, and the said plate enters the high-pressure cylinder and forms its head.

I claim as my invention—

1. The combination in a tandem compound
15 engine, of two cylinder-castings placed in line, with a head forming a partition between the high and low pressure cylinders, said head being held by and confined between said two castings and means for holding the cast-
20 ings together independently of said head, substantially as described.

2. The combination in a tandem compound engine, of two cylinder-castings, the high and the low pressure cylinders being made sepa-
25 rate and secured together, a flanged partition-head and bolts for securing said high and low pressure cylinder castings together independently of the partition-head, said head being confined between and held in position by
30 portions of the two cylinders, substantially as described.

3. The combination in a tandem compound engine, of the high-pressure-cylinder casting, the low-pressure-cylinder casting, a partition-
35 head between said castings, means for clamping the two castings together independently of said partition-head, and a cap for the head secured between two of said members, sub-
stantially as described.

4. The combination in a tandem compound engine of the high-pressure-cylinder casting, the low-pressure-cylinder casting, each cast-
40 ing having a valve-chest integral therewith, bolts for securing the cylinder-castings and their valve-chests together, and a partition-
45 plate independent of said castings and held in position between the two cylinders independently of said securing-bolts, substantially as described.

5. The combination in a tandem compound engine, of the independent high and low pres-
50 sure cylinders, each having a valve-chest, said valve-chests being in line, a bushing in

each valve-chest, one of said bushings ex-
tending across the space between the valve- 55
chests, and bolts for securing the valve-
chests together, substantially as described.

6. The combination in a tandem compound engine of the high and low pressure cylin-
60 ders, independent valve-chests in line with each other, for said cylinders, a bushing in each valve-chest, one of said bushings ex-
tending from its valve-chest into the other valve-chest, a packing-gland for said extend-
65 ed bushing and bolts securing the chests to-
gether, substantially as described.

7. The combination in a tandem compound engine, of the high and low pressure cylin-
70 ders, each having a valve-chest, said valve-chests being in line, a bushing in one valve-
chest extending into the other valve-chest, a packing-gland, and bolts securing the chests
together, said bolts passing through the
75 flange of the gland and provided with nuts for tightening the gland, substantially as de-
scribed.

8. The combination in a tandem compound engine, of the independent high and low pres-
80 sure cylinders, each casting having a valve-chest, bushings in the valve-chests, a parti-
tion-head mounted between the high and low pressure cylinders, a cap mounted between
the head and the high-pressure cylinder and
85 having a cavity for the reception of packing for the piston-rod, and external bolts secur-
ing the cylinder-castings together independ-
ently of said partition-head, substantially as described.

9. The combination in a tandem compound engine, of the independent high and low pres-
90 sure cylinder castings, means for securing the two castings together, a partition-head
clamped between the two castings, a cap mounted on the partition-head and having a
cavity for the reception of packing, bolts and
95 nuts for securing the cap to the partition-head, the said nuts resting in the groove in the high-pressure-cylinder casting, substan-
tially as described.

In testimony whereof I have signed my
100 name to this specification in the presence of two subscribing witnesses.

SAMUEL M. VAUCLAIN.

Witnesses:

FRED. WOOLLNEN,

STEWART McNAUGHTON, Jr.